CLASSIFICATION CONFIDENTIAL CONFIDENTIAL

50X1-HUM

CENTRAL INTELLIGENCE AGENCY
INFORMATION FROM
FOREIGN DOCUMENTS OR RADIO BROADCASTS

REPORT

CD NO.

COUNTRY	USSR	DATE OF INFORMATION	1950
SUBJECT	Scientific - Medical, substitute for human blood plasma	DATE DIST.	24 Apr 1951
HOW PUBLISHED	Monthly periodical		
WHERE PUBLISHED	Moscow	NO. OF PAGES	2
DATE PUBLISHED	Apr 1950	SUPPLEMENT TO REPORT	
LANGUAGE	Russian		

50X1-HUM

THIS IS UNEVALUATED INFORMATION

SOURCE Doklady Vsesoyuznoy Ordena Lenina Akademii Sel'skokhozyaystvennykh Nauk imeni V. I. Lenina, Vol XV, No 4, pp 14-19.

UTILIZATION OF THE BLOOD OF FARM ANIMALS. PART VII. BIOLOGICAL PROPERTIES OF THE BLOOD OBTAINED FROM CATTLE PREVIOUSLY SUBJECTED TO BLOODLETTING WHILE ALIVE

L. Ye. Kaplan

[This is a contribution from the Laboratory of the Moscow Chemico-Technological Institute of the Meat Industry. It was presented by Academician N. G. Belen'kiy and submitted for publication on 6 March 1950.]

Biological evaluation of the starting material for the preparation of species nonspecific serum (VNS) is very important, because the final product is one of the best substitutes for human blood plasma. Because posthemorrhagic blood is used in the preparation of VNS, we first investigated the blood obtained at different times after withdrawing 40-50% of the total volume of blood (No 1) of a living animal. Subsequent to removing the amount of blood indicated above (under the assumption that the total quantity of blood corresponds to 1/13 of the weight of the animal), we took a second (No 2) portion of the blood, 4 hours after the original bloodletting, and a third (No 3) portion, 24 hours after the initial operation. The sera of the blood portions mentioned above were obtained either by centrifuging the blood which had not yet coagulated or else by the method of settling. Before being tested, the samples of blood or serum were kept cold with a temperature of the surrounding medium in the range between 0° and 1°C.

Samples of all portions of serum were tested in regard to the action which they exerted on the activity of blood vessels and of the heart as well as on the motility of the stomach, the intestine, and the uterus. In order to determine changes in the activity of blood vessels under the effect of the serum which was tested, we used excised parts of the mesenteric artery of cattle, blood vessel preparations from the ear of the rabbit, and blood vessel preparations from the hind legs of the frog. The tonus of a blood vessel part

CLASSIFICATION CONFIDENTIAL CONFIDENTIAL

STATE	X	NAVY	X	NSRB	DISTRIBUTION
ARMY	X	AIR	X	FBI	

taken from a warm-blooded animal was found to increase sharply under the action of the serum of blood obtained from an animal subsequent to bloodletting. This effect was not observed in the case of the serum of blood removed from the animal originally; i.e. before any prior bloodletting had been carried out.

The property of increasing the vasal tonus becomes noticeable in the blood of cattle 4-5 hours after the original bloodletting and is conserved during the following 24 hours. When species nonspecific serum is prepared according to Belen'kiy's procedure (devised in 1945) from blood which had been taken from cattle 24 hours after copious blood losses had been incurred while the animal was alive, the acquired vasoconstrictive capacity is retained.

These results were fully confirmed on preparations from rabbit ears and frog legs. Serum No 2 had the strongest vasoconstrictive effect on these two test objects.

One must assume on the basis of these results that substances which increase the tonus of blood vessels accumulate in the blood of cattle after the living animal has suffered a great loss of blood. Under the effect of such a loss the blood begins to stimulate the action of the heart.

The action of the sera was tested on the heart of a cold-blooded animal. The highest degree of stimulation of the heart was observed with serum No 2 (i.e., after 4 hours). In the case of serum No 3 this effect was slightly reduced.

Against the background of a heart working with the parasympathetic nervous system inactivated by the action of atropine, the stimulating effect of sera prepared from blood which had been taken from the animal subsequent to bloodletting is still more pronounced. On the other hand, the effect of these sera disappears almost completely when the heart has been ergotaminized (i.e., the sympathetic nervous system has been inactivated).

Thus, substances of a sympathicotropic nature accumulate in the blood of cattle after the living animal has suffered an extensive blood loss. These substances remain in the species nonspecific serum, although in a slightly reduced quantity.

Our experiments on the motility of the intestine were carried out on an excised portion of rabbit intestine. Here serum No 1 stimulated the tonus to a greater extent than sera No 2 and No 3. The reduced effect exhibited by sera No 2, and No 3 is retained by the species nonspecific serum [prepared from the original sera]. The same relationships are observed when the action of the sera are tested on an isolated frog stomach. They become more sharply expressed when the parasympathetic system of the stomach is inactivated with atropine.

The experimental data do not support the view that there may be a change in the acetylcholine content of the blood of cattle after the animals have been subjected to bloodletting. There is also no accumulation of histamine or substances having an effect similar to histamine in the blood of animals subsequent to bloodletting. This can be seen from the results obtained by testing the action of all three sera (No 1, No 2, and No 3) on the virgin uterus of a guinea pig. The quantity of histamine and similar substances contained in the blood of cows taken before bloodletting is the same as in that obtained after bloodletting. As a matter of fact, it is even reduced in the latter case.

To summarize, the results show that removal of 40-50% of the blood of cattle induces accumulation of sympathicotropic substances in posthemorrhagic blood. These substances stimulate the functions of the cardiovascular system of the organism.

- E N D -